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10/616,385	07/09/2003	Akihiro Iino	S004-5064	1246

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EXAMINER	
DOUGHERTY, THOMAS M	

ART UNIT	PAPER NUMBER
2834	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/616,385	IINO ET AL.	
	Examiner	Art Unit	
	Thomas M. Dougherty	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1 and 4-19* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *2 and 3* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5-8, 11 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 5 and 6 the description of the support member extending in a contact direction **between** the vibrating body and contact member is confusing. The support member is not shown **between** these elements in any embodiment. The only elements between the vibrating body and the contact member are the friction members. In claim 7 it is not clear how a pressurization force is applied to the support member, in the figures shown, the support, while near the spring, or serving as a support for it, is not subject directly to the force which it exerts. Claim 11 is written in a confusing manner, specifically "it is the piezoelectric motor operating a movable body". Claim 12 notes that the spring acts "to the vicinity of node of vibration" which is not understood. Perhaps the applicants intended to say that the spring acts "**at** the vicinity of node of vibration".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 5-8 (as best understood), 10, are rejected under 35 U.S.C. 102(b) as being anticipated by Okazaki et al. (US 6,104,123). Okazaki shows (fig. 1C) a piezoelectric motor operating, by vibration of a vibrating body (11) having a piezoelectric element (12), a contact member (41) or the vibrating body (11) itself, comprising: a support member (21) which engages with the vibrating body (11) in the vicinity of a position of node (col. 7, lines 48-53) of vibration ex[c]ited by the vibrating body (11), and which supports the vibrating body (11) while regulating a motion of the vibrating body (11) in a direction (e.g. laterally) other than a contact direction between the vibrating body (11) and the contact member (41), a contact member (41) contacting with the vibrating body (11) or a friction member (14b) provided in the vibrating body (11), and a pressurization means (31) for pressurizing between the vibrating body (11) and the contact member (41).

The friction member (14b) has a portion extended from the vibrating body (11).

The piezoelectric motor comprises a support member (21) provided in the vibrating body (11) and extending in a contact direction between the vibrating body (11) and the contact member (41), as that description is best understood, and a guide member (11a) guiding the support member (21), and a motion in a direction other than a contact direction between a friction member (14a, 14b) provided in the vibrating body (11) and the contact member (41) is regulated by the support member (21) and the guide member (11a).

The piezoelectric motor comprises a support member (21) provided in the vibrating body (11) and extending in a contact direction between the vibrating body (11) and the contact member (41), a guide member (11a) guiding the support member (21), and a spring member (31) applying a contact pressure between the vibrating body (11) and the contact member (41), the friction member (14a, 14b) provided in the vibrating body (11) and the contact member (41) are guided by the support member (21) and the guide member (11a) so as to be movable in a contact direction, and a rotation of the vibrating body (11) about the support member (21) is constrained by the spring member (31) and a spring guide portion (where spring 31 is secured to the cover 33a, see col. 8, line 66 to col. 9, line1) engaging with the spring member.

The piezoelectric motor comprises a guide portion (11a) provided in the vibrating body (11), and a support member (21) having an engagement portion engaging (lower part) with the guide member (11a), and a contact pressure between the vibrating body (11) or a friction member (14a, 14b) provided in the vibrating body (11) and the contact member (41) is obtained by applying a pressurization force to the support member, as that description is best understood.

As noted, the guide portion (11a) is provided in the vicinity of a position of node of vibration excited by the vibrating body (11).

In figure 7C is shown, a pressurization (31) applying a contact pressure between the friction member (14e, 14g) and the contact member (43a, 43b) acts on plural points (all points covered by the plate 32, note also col. 9, lines 7-9 that the coil spring may be replaced by a plate spring) in a width direction of the vibrating body (11), and a shape of

the friction member is one at least having a curved line toward the width direction of the vibrating body (11).

Claims 1, 4, 5-8 (as best understood), 9, 14 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Takagi (US 5,852,336). Takagi shows (figs. 1A, 1B, 2C) a piezoelectric motor operating, by vibration of a vibrating body (11) having a piezoelectric element (12, 13), a contact member (21-1, 21-2) or the vibrating body (11) itself, comprising: a support member (24-1, 24-2) which engages with the vibrating body (11) in the vicinity of a position of node (in figure 3B, see the first graph under the figure of the vibrating body and note that a node exists at X, which is in the middle of the device, where the supports 24-1 and 24-2 are located) of vibration ex[c]ited by the vibrating body (11), and which supports the vibrating body (11) while regulating a motion of the vibrating body (11) in a direction (e.g. laterally) other than a contact direction between the vibrating body (11) and the contact member (21-1, 21-2), a contact member (21-1, 21-2) contacting with the vibrating body (11) or a friction member (11b, 11c) provided in the vibrating body (11), and a pressurization means (25-1, 25-2) for pressurizing between the vibrating body (11) and the contact member (21-1, 21-2).

The friction member (11b, 11c) has a portion extended from the vibrating body (11).

The piezoelectric motor comprises a support member (24-1, 24-2) provided in the vibrating body (11) and extending in a contact direction between the vibrating body (11) and the contact member (21-1, 21-2), as that description is best understood, and a guide member (guide holes in extensions 11d, 11e) guiding the support member (24-1,

24-2), and a motion in a direction other than a contact direction between a friction member (11a, 1bb) provided in the vibrating body (11) and the contact member (21-1, 21-2) is regulated by the support member (24-1, 24-2) and the guide member (guide holes in extensions 11d, 11e).

The piezoelectric motor comprises a support member (24-1, 24-2) provided in the vibrating body (11) and extending in a contact direction between the vibrating body (11) and the contact member (21-1, 21-2), a guide member (guide holes in 11d, 11e) guiding the support member (24-1, 24-2), and a spring member (25-1, 25-2) applying a contact pressure between the vibrating body (11) and the contact member (21-1, 21-2), the friction member (11a, 11b) provided in the vibrating body (11) and the contact member (21-1, 21-2) are guided by the support member (21) and the guide member (guide holes in 11d, 11e) so as to be movable in a contact direction, and a rotation of the vibrating body (11) about the support member (24-1, 24-2) is constrained by the spring member (25-1, 25-2) and a spring guide portion (note the spring cannot move horizontally, i.e. it is guided vertically, due to its being secured to the flange 24a-1, 24a-2) engaging with the spring member (25-1, 25-2).

The piezoelectric motor comprises a guide portion (guide holes in 11d, 11e) provided in the vibrating body (11), and a support member (24-1, 24-2) having an engagement portion engaging with the guide member (guide holes in 11d, 11e), and a contact pressure (via spring 25-1, 25-2) between the vibrating body (11) or a friction member (11b, 11c) provided in the vibrating body (11) and the contact member (21-1,

21-2) is obtained by applying a pressurization force to the support member, as that description is best understood.

As noted, the guide portion (guide holes in 11d, 11e) is provided in the vicinity of a position of node of vibration excited by the vibrating body (11).

A contact pressure between the friction member (11b, 11c) and the contact member (21-1, 21-2) is obtained by pressurizing an extending portion (11d, 11e) provided in the vibrating body (11) by means of the support member (24-1, 24-2), the extending portion (11d, 11e) engages with the support member (24-1, 24-2) and performs a rotation (see fig. 3D, where rotation is evident) with a center line of the extending portion being made a rotation center (as noted, this is a nodal position), and an engagement portion (guide holes in 11d, 11e) between the extending portion (11d, 11e) and the support member (24-1, 24-2) has a shape regulating an operation (e.g. suppressing lateral motion) other than the rotation operation.

An electronic equipment with piezoelectric motor, further comprising a transmission mechanism (11b, 11c) operating monolithically (taken to means that this is its only purpose) with a movable body (21-1, 21-2), and an output mechanism (31) operating on the basis of an operation of the transmission mechanism (11b, 11c).

Claims 1-4, 5-8 (as best understood), 9 and 11-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Funakubo et al. (US 5,416,375). Funakubo et al. show (fig. 2) a piezoelectric motor operating, by vibration of a vibrating body (11) having a piezoelectric element (12), a contact member (25) or the vibrating body (11) itself,

comprising: a support member (22) which engages with the vibrating body (11) in the vicinity of a position of node (see fig. 3B) of vibration ex[c]ited by the vibrating body (11), and which supports the vibrating body (11) while regulating a motion of the vibrating body (11) in a direction (e.g. laterally) other than a contact direction between the vibrating body (11) and the contact member (25), a contact member (25) contacting with the vibrating body (11) or a friction member (14) provided in the vibrating body (11), and a pressurization means (28) for pressurizing between the vibrating body (11) and the contact member (25).

The friction member (14) has a portion extended from the vibrating body (11).

The piezoelectric motor comprises a support member (22) provided in the vibrating body (11) and extending in a contact direction between the vibrating body (11) and the contact member (25), as that description is best understood, and a guide member (holes for 13 in the support member) guiding the support member (22), and a motion in a direction other than a contact direction between a friction member (14) provided in the vibrating body (11) and the contact member (25) is regulated by the support member (22) and the guide member (holes for 13 in the support member).

The piezoelectric motor comprises a support member (22) provided in the vibrating body (11) and extending in a contact direction between the vibrating body (11) and the contact member (25), a guide member (guide holes 22 for 13) guiding the support member (22), and a spring member (28) applying a contact pressure between the vibrating body (11) and the contact member (25), the friction member (14) provided in the vibrating body (11) and the contact member (25) are guided by the support

member (22) and the guide member (holes in 22 for 13) so as to be movable in a contact direction, and a rotation of the vibrating body (11) about the support member (22) is constrained by the spring member (by downward pressure of 28) and a spring guide portion (e.g. bearing 27 in contact roller 26 held by fixing portion 29) engaging with the spring member (28).

The piezoelectric motor comprises a guide portion (guide holes in 22 for 13) provided in the vibrating body (11), and a support member (22) having an engagement portion engaging with the guide member (guide holes in 22 for 13), and a contact pressure (via spring 28) between the vibrating body (11) or a friction member (14) provided in the vibrating body (11) and the contact member (25) is obtained by applying a pressurization force (via 28) to the support member (22), as that description is best understood.

As noted, the guide portion (guide holes in 22 for 13) is provided in the vicinity of a position of node of vibration excited by the vibrating body (11).

A contact pressure between the friction member (14) and the contact member (25) is obtained by pressurizing (via 28) an extending portion (13) provided in the vibrating body (11) by means of the support member (22), the extending portion (13) engages with the support member (22) and performs a rotation (note its central, nodal location) with a center line of the extending portion being made a rotation center (as noted, this is a nodal position), and an engagement portion (guide holes in 22 for 13) between the extending portion (13) and the support member (22) has a shape

regulating an operation (e.g. suppressing lateral motion) other than the rotation operation.

An electronic equipment with piezoelectric motor, further comprising a transmission mechanism (14) operating monolithically (taken to means that this is its only purpose) with a movable body (25), and an output mechanism (26) operating on the basis of an operation of the transmission mechanism (14).

The piezoelectric motor operates on a movable body that is the contact member (25), the vibrating body (11) is supported (by 13) so as to be rotatable by a rotation shaft (13) provided in the vibrating body, and a contact pressure (via 28) is applied to the vibrating body (11) and the movable body (25) by a pressurization force from a spring member (28).

The pressurization force from the spring member (28) acts to the vicinity of the position of node (at 13) of vibration exited by the vibrating body (11). Note that as the spring exerts force on the plate, 25, and the plate extends over the node at 13, the pressurization force is exerted at the vicinity of the node at some degree.

The pressurization force from the spring member (28) acts as a torque of the rotation shaft (13). Note that as the element 14 as shown in fig. 3(b) opposes the spring, about the node shown, the spring acts as a torque of the rotation shaft.

An electronic equipment with piezoelectric motor as described, further comprising a transmission mechanism (14) operating monolithically with a movable body (25), and an output mechanism (26) operating on the basis of an operation of the transmission mechanism (14).

A stage (25, stainless steel plate considered a stage as it is a plate, it qualifies as such) having the piezoelectric motor as described above, further comprising a transmission mechanism (14) operating monolithically with a movable body (25), and an output mechanism (26) operated on the basis of an operation of the transmission mechanism (14).

Allowable Subject Matter

Claims 2 and 3 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to show or fairly suggest plural concave portions provided in a vibrating body, and a support member having plural convex portions engaging with the concave portions, or the concave and convex portions in the opposite configuration, in a piezoelectric motor with pressurization means and a contact member which is driven and is in friction or other contact with the vibrating body.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The remaining prior art reads on at least some aspects of the claimed invention.

Direct inquiry to Examiner Dougherty at (571) 272-2022.

tmd

tmd

December 23, 2004

TOM DOUGHERTY
PRIMARY EXAMINER